

Abstract

We propose to measure the two polarization response functions $R_{TT'}^t$ and $R_{LT'}^t$ in the $d(\vec{e}, e'\vec{n})p$ reaction at $Q^2 = 0.30 \text{ (GeV/c)}^2$ with a polarized electron beam of 1.6 GeV. The measurements will be performed at $\theta_{nq}^{cm} = 38^\circ$ by detecting neutrons on each side of \vec{q} in quasi-perpendicular kinematics; θ_{nq}^{cm} is the angle of the emitted neutron with respect to the three momentum transfer in the center-of-mass system of the deuteron. These measurements are expected to be sensitive to final-state interactions, meson-exchange currents, and relativistic effects, and are intended to provide tests of various models of these effects. These measurements will complement similar measurements of the proton polarization in the electrodisintegration of the deuteron. Measurements of response functions from a recoil neutron in the $d(\vec{e}, e'\vec{n})p$ reaction are essential for a complete description of deuteron electrodisintegration. This experiment will begin to provide the necessary neutron measurements and will allow one to look for differences between the neutron and proton measurements.